

Remarks

This communication is considered fully responsive to the Office Action. Claims 1-24 were examined. Claims 1-24 stand rejected. Claims 1, 6, 8, 11, 18, 20, and 22 are amended. No claims are canceled. New claims 25 and 26 have been added. Support is found for the new claims in the specification as originally filed, e.g., paragraphs [0027] and [0031], respectively. Reexamination and reconsideration of the pending claims are respectfully requested.

Drawing Objections

The Office Action objected to the drawings because they include reference characters 440a and 440b in Figure 4 not mentioned in the specification. However, paragraph [0046] of the specification as originally filed refers to “logical groupings of LUNs 440a-c.” Therefore, Applicant believes no amendment of the drawings or specification is necessary.

Specification

The Office Action objected to the disclosure because the use of the acronym “LUN” without first including a description in plain text. Applicant notes that LUN was defined in the specification as originally filed, e.g., at paragraph [0020] stating “logical disks (also called logical units or LUNs) 112a, 112b.” However, Applicant has also amended paragraph [0005] to define LUN the first time it is used.

Claim Rejections - 35 U.S.C. 112

The Office Action rejected claims 1-24 under 35 U.S.C. 112, second paragraph, for reasons set forth in the Office Action. Applicant believes the amendments address these rejections.

With regard to claim 20, paragraph [0018] of the specification as originally filed states “A storage network 100 may include storage devices 110a-c (generally referred to herein as “storage devices 110”) communicatively coupled in a suitable communications network 120.” Thus the specification is believed to be clear on the relationship of these components and no amendment to claim 20 is believed to be necessary.

Claim Rejections - 35 U.S.C. 101

The Office Action rejected claims 1-10 under 35 U.S.C. 101 as drawn to a computer program product defined in paragraph [0070] of the specification to encompass an electronic transmission signal. Applicant respectfully traverses this rejection.

The specification does not state that a computer program product is “an electronic transmission signal,” but rather that it includes instructions stored in various computer-readable storage media. Paragraph [0070] states:

Generally, the data processors of computing device 730 are programmed by means of instructions stored at different times in the various computer-readable storage media of the computer. Programs and operating systems may distributed, for example, on floppy disks, CD-ROMs, or electronically, and are installed or loaded into the secondary memory of a computer. At

execution, the programs are loaded at least partially into the computer's primary electronic memory.

This is a standard definition of software which may be stored on disks, CD-ROMs etc. for distribution. Applicant respectfully requests withdrawal of the rejection of claims 1-10 on this basis.

Claim Rejections - 35 U.S.C. 103(a) – Hinton and Tawil

The Office Action rejected claims 1-2, 4, 6-7, 9, 11-14, 16-17, 20-21, and 23-24 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 2003/0037187 to Hinton, et al. (“Hinton”) in view of U.S. Patent No. 6,421,723 to Tawil (“Tawil”). Applicant respectfully traverses this rejection.

Claim 1 is amended to recite “for each host port connection, determining actual loading of IO jobs for each of the storage devices based at least in part on a queue depth for each of the host port LUNs” (emphasis added). The references fail to teach or suggest at least these recitations.

The Office Action cites to paragraphs [0026]-[0027] in Hinton as disclosing all but the queue depth in this recitation. However, Hinton describes a storage monitoring system that determines “useful data storage information (such as number and location of files, disk capacity, available disk space, and the like) and to then report the information to a requesting customer.” Paragraph [0026]. That is, Hinton discloses determining information about the storage device itself, but there is no disclosure of determining actual loading of IO jobs. Nor would it be obvious to determine actual loading of IO jobs

based on the disclosure of Hinton. The teachings of Hinton are directed to determining characteristics of the storage itself, and not to communications between the hosts and the storage system. See, e.g., Abstract in Hinton.

In addition, the Office Action relies on Tawil as disclosing the queue depth recited in claim 1. Applicant argues that Tawil is not properly combined with Hinton. In its decision, *KSR Int'l Co. v. Teleflex, Inc.*, No 04-1350 (U.S. Apr. 30, 2007), the Supreme Court reaffirmed application of the Graham factors in making a determination of obviousness under 35 U.S.C. § 103(a). The four factual inquiries under Graham are: (1) determining the scope and contents of the prior art; (2) ascertaining the differences between the prior art and the claims in issue; (3) resolving the level of ordinary skill in the pertinent art; and (4) evaluating evidence of secondary consideration. Even if all of the prior art elements are disclosed by separate prior art references, the Examiner still must identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed.

The Office Action states that “one would have been motivated to use the queue depth to determine actual loading since the amount of work waiting on the host to [sic] connection to complete would be dependent upon the number of resources waiting for the host connection.” However, Hinton discloses a storage monitoring system that determines “useful data storage information (such as number and location of files, disk capacity, available disk space, and the like) and to then report the information to a requesting customer.” Paragraph [0026]. There is no disclosure in Hinton of determining actual loading of IO jobs, and therefore, there would be no need to use a queue or queue depth.

For at least the foregoing reasons claim 1 is believed to be allowable over the cited references and Applicant respectfully requests withdrawal of the rejection of claim 1.

Claims 2 and 4 depend from claim 1, which is believed to be allowable. Therefore, claims 2 and 4 are also believed to be allowable for at least the same reasons as claim 1.

In addition, claim 2 recites “determining actual loading for each of the storage devices based at least in part on a number of host groups in the storage network.” The Office Action relies broadly on paragraph [0024] in Hinton as disclosing these recitations, however, Applicant cannot find any support for this rejection in paragraph [0024].

Claim 4 recites “uses a loading factor to determine if the actual loading for each of the storage devices exceeds a maximum loading.” Again, Hinton is not concerned with loading as discussed above for claim 1, and therefore Hinton also fails to disclose the further recitations of claim 4.

Withdrawal of the rejection of claims 2 and 4 is respectfully requested.

Claim 6 is rejected for the same reasons as claim 1 and therefore is believed to be allowable for at least the same reasons as claim 1. For at least the foregoing reasons claim 6 is believed to be allowable over the cited references and Applicant respectfully requests withdrawal of the rejection of claim 6.

Claims 7 and 9 depend from claim 6, which is believed to be allowable. Therefore, claims 7 and 9 are also believed to be allowable for at least the same reasons as claim 6. Claims 7 and 9 are also believed to be allowable for the additional reasons set

forth above for claims 2 and 4, respectively. Withdrawal of the rejection of claims 7 and 9 is respectfully requested.

Claim 11 is rejected for the same reasons as claim 1 and therefore is believed to be allowable for at least the same reasons as claim 1. In addition, claim 11 is amended to recite “A ~~method of device loading~~ providing an input/output (IO) flow control mechanism in a storage network.” The combination of references does not teach or suggest at least these recitations.

For at least the foregoing reasons claim 11 is believed to be allowable over the cited references and Applicant respectfully requests withdrawal of the rejection of claim 11.

Claims 12-14, and 16-17 depend from claim 11, which is believed to be allowable. Therefore, claims 12-14, and 16-17 are also believed to be allowable for at least the same reasons as claim 11.

In addition, claims 12-14 and 16-17 include further recitations for “automatically determining actual loading for the storage device”. Again, Hinton is not concerned with loading as discussed above for claim 1, and therefore Hinton also fails to disclose the further recitations of claims 12-14 and 16-17. Withdrawal of the rejection of claims 12-14, and 16-17 is respectfully requested.

Claim 20 is rejected for the same reasons as claim 1 and therefore is believed to be allowable for at least the same reasons as claim 1. Claim 20 is also amended to recite “determining actual loading of the at least one storage device based at least in part on ~~the~~ a queue depth of each host port connection so that the number of input/output (IO) jobs

being issued by a host do not exceed the queue depth of a service queue.” The combination of references does not teach or suggest at least these recitations.

For at least the foregoing reasons claim 20 is believed to be allowable over the cited references and Applicant respectfully requests withdrawal of the rejection of claim 20.

Claims 21 and 23-24 depend from claim 20, which is believed to be allowable. Therefore, claims 21 and 23-24 are also believed to be allowable for at least the same reasons as claim 20. Withdrawal of the rejection of claims 21 and 23-24 is respectfully requested.

In addition, claims 21 and 23-24 include further recitations for “determining actual loading”. Again, Hinton is not concerned with loading as discussed above for claim 1, and therefore Hinton also fails to disclose the further recitations of claims 21 and 23-24. Withdrawal of the rejection of claims 21 and 23-24 is respectfully requested.

Claim Rejections - 35 U.S.C. 103(a) – Hinton, Tawil and Nahum

The Office Action rejected claims 3, 5, 8, 10, 15, 18-19, and 22 under 35 U.S.C. 103(a) as being unpatentable over Hinton and Tawil and further in view of U.S. Patent No. 2004/0078599 to Nahum (“Nahum”). Applicant respectfully traverses this rejection.

Claims 3 and 5 depend from claim 1, claims 8 and 10 depend from claim 6, claims 15 and 18-19 depend from claim 11, and claim 22 depends from claim 20. Each of the independent claims is believed to be allowable. Therefore, each of these dependent

claims is also believed to be allowable for at least the same reasons as the respective independent claims.

In addition, claim 3 recites “determining actual loading for each of the storage devices based at least in part on a number of LUN security groups in the storage network.” The Office Action admits that Hinton and Tawil do not disclose these recitations. Applicant agrees with this admission. However, the Office Action relies on paragraph [0018] in Nahum as disclosing these recitations. Applicant disagrees. Paragraph [0018] describes a security procedure for authenticating each host. Nahum does not determine actual loading for each of the storage devices based at least in part on a number of LUN security groups in the storage network. Claims 8, 15, and 22 include similar recitations as claim 3.

Claim 5 recites “the computer process further simplifies host groups and LUN security groups into virtual connections for analysis.” Again the Office Action cites broadly to paragraph [0018] in Nahum as disclosing these recitations. However, Applicant cannot find any basis for the rejection in paragraph [0018]. Claim 10 includes similar recitations as claim 5.

Claim 18 recites “wherein the maximum loading for the storage device is based on a loading factor” and claim 19 recites “the loading factor is in the range of about 80% to 90% of the service queue depth for the storage device.” The Office Action relies broadly on paragraph [0085] in Nahum as disclosing these recitations. However, Applicant cannot find any basis for the rejection in paragraph [0085].

Withdrawal of the rejection of claims 3, 5, 8, 10, 15, 18-19, and 22 is respectfully requested.

Conclusion

The Applicant respectfully requests that a timely Notice of Allowance be issued in this matter.

Respectfully Submitted,

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By: _____

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